

What is claimed is:

1. A method for fabricating media having contaminant-sorbent and antimicrobial properties, the method comprising:

(a) irrigating a multitude of contaminant-sorbent polymer particles with a solution containing an antimicrobial compound;

wherein

(b) the antimicrobial compound and the polymer of the particles are reactive together; and

(c) the polymer is substantially phobic to water and to the solution;

whereby the antimicrobial compound grafts onto the polymer particles and, upon contact with water, the polymer particles sorb contaminants from the water and reduce proliferation of microbial organisms.

2. The method of claim 1 wherein irrigating particles comprises irrigating a multitude of loose granules or fragment with the solution, wherein substantially all surfaces of each individual particle is exposed to the solution.

3. The method of claim 1 wherein irrigating particles comprises irrigating a multitude of polymer particles that are hydrocarbon-sorbent.

4. The method of claim 3 further comprising:

- (a) substantially drying the solution from polymer particles that are granules; and
 - (b) extruding the polymer particles into fragments of filter media.
5. The method of claim 4 further comprising supporting the fragments about an open recess within a filter module, whereby the filter module is capable of both removing oil from water passing into the open recess and reducing proliferation of microbial organisms.
6. The method of claim 1 wherein providing the solution comprises providing, dissolved in water, a quantity of an organosilane compound not susceptible to self-condensation in water.
7. The method of claim 6 further comprising dissolving the organosilane compound in the water to prepare the solution.
8. The method of claim 1 wherein irrigating the polymer particles with the solution comprises immersing the particles in a static volume of the solution for a predetermined period of time.
9. The method of claim 1 wherein:
- (a) irrigating the polymer particles comprises irrigating particles substantially consisting of a mixture of:

- (1) particles of styrene-butadiene-styrene or hydrogenated styrenic block copolymer; and
 - (2) particles of ethylene propylene monomer or ethylene propylene diene monomer;
- (b) the particles of ethylene propylene monomer or ethylene propylene diene monomer comprise about 10-30% of the mixture, by weight; and
- (c) the particles of styrene-butadiene-styrene or hydrogenated styrenic block copolymer are comprised of about 25-45% styrene and are in the range of about 4-20 mesh.

10. A fragment of filter media comprising:

- (a) an oil-sorbent, hydrophobic copolymer in a matrix of compliant, hydrophobic, olefinic polymer; and
- (b) an antimicrobial compound grafted to the copolymer and polymer;

whereby the fragment is capable of both sorbing oil from surrounding water and reducing proliferation of microbial organisms.

11. The fragment of claim 10 wherein:

- (a) the antimicrobial compound is an organosilane compound not susceptible to self-condensation in water;

- (b) the compliant, hydrophobic polymer is ethylene propylene monomer or ethylene propylene diene monomer; and
- (c) the oil-sorbent, hydrophobic copolymer is styrene-butadiene-styrene or hydrogenated styrenic block copolymer.

12. A filter system comprising:

- (a) a multitude of irregular, macroscopic fragments comprised of an oil-sorbent, hydrophobic copolymer in a matrix of compliant, hydrophobic polymer;
- (b) an antimicrobial compound grafted to the fragments; and
- (c) a filter module supporting the fragments adjacent to an aperture;

whereby the filter system is capable of both sorbing oil from water passing into contact with the fragments via the aperture and reducing proliferation of microbial organisms.

13. The filter system of claim 12 wherein the antimicrobial compound is an organosilane compound not susceptible to self-condensation in water.

14. The filter system of claim 12 wherein:

- (a) the compliant, hydrophobic polymer is ethylene propylene monomer or ethylene propylene diene monomer; and
- (b) the oil-sorbent, hydrophobic copolymer is styrene-butadiene-styrene or hydrogenated styrenic block copolymer.

15. A method for improving chemical and biological purity of a water stream containing contaminants, the method comprising directing flow of the water stream through interstices of a multitude of irregular, macroscopic fragments that:

(a) are hydrophobic but sorbent of the contaminants; and

(b) have antimicrobial compound on their surfaces;

whereby one or more targeted contaminants are sorbed from the water and proliferation of microbial organisms is reduced.

16. The method of claim 15 wherein, prior to directing flow of the water stream, the water stream contains hydrocarbons and wherein the fragments are sorbent of hydrocarbons.

17. The method of claim 16 wherein directing flow comprises directing flow of the water through fragments further comprised of:

(a) a matrix of compliant, hydrophobic polymer; and

(b) an oil-sorbent, hydrophobic copolymer in the matrix.

18. The method of claim 17 wherein directing flow comprises directing flow of the water through fragments further comprised of an antimicrobial compound grafted to:

(a) a portion of the polymer of the matrix; and

(b) a portion of the oil-sorbent, hydrophobic copolymer in the matrix.

19. The method of claim 18 wherein directing flow comprises directing flow of the water through fragments wherein the antimicrobial compound grafted thereto comprises an organosilane compound not susceptible to self-condensation in water.

20. The method of claim 18 wherein directing flow comprises directing flow of the water through fragments wherein:

(a) the compliant, hydrophobic polymer consists of ethylene propylene monomer or ethylene propylene diene monomer; and

(c) the oil-sorbent, hydrophobic copolymer consists of styrene-butadiene-styrene or hydrogenated styrenic block copolymer.